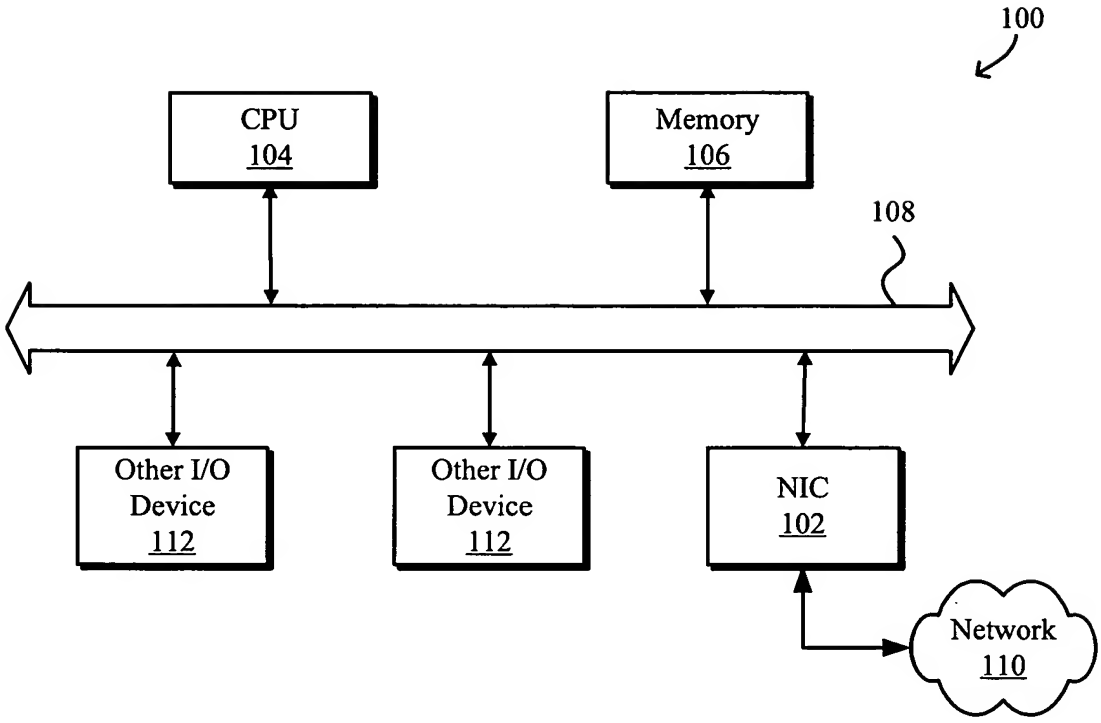

100
CPU
104
Memory
106
108
Other I/O
Device
112
Other I/O
Device
112
NIC
102
Network
110

FIG. 1

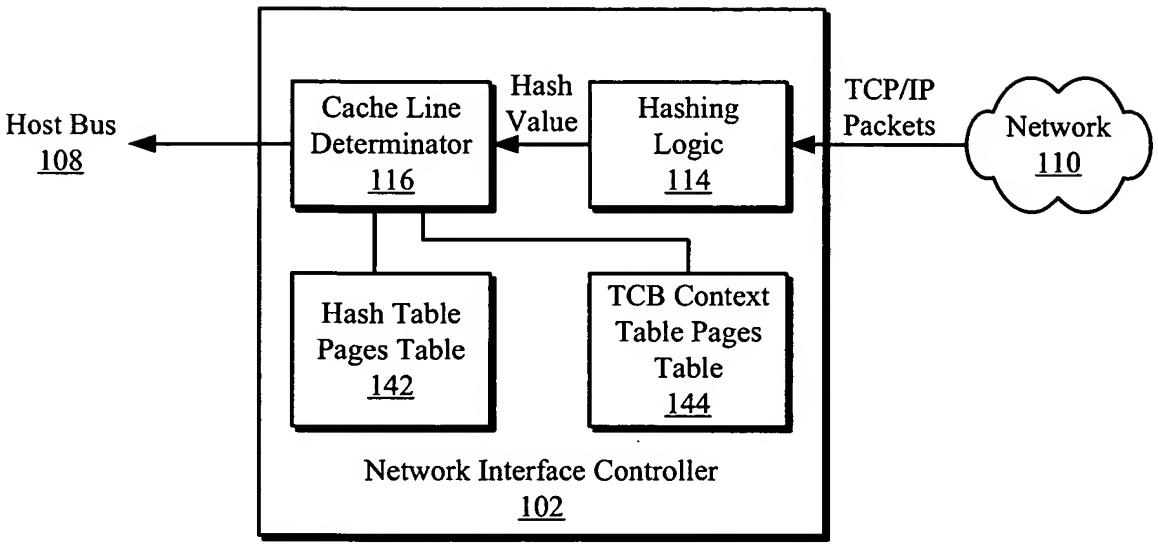

Host Bus
108
Cache Line
Determinator
116
Hash
Value
Hashing
Logic
114
TCP/IP
Packets
Network
110
Hash Table
Pages Table
142
TCB Context
Table Pages
Table
144
Network Interface Controller
102

FIG. 2

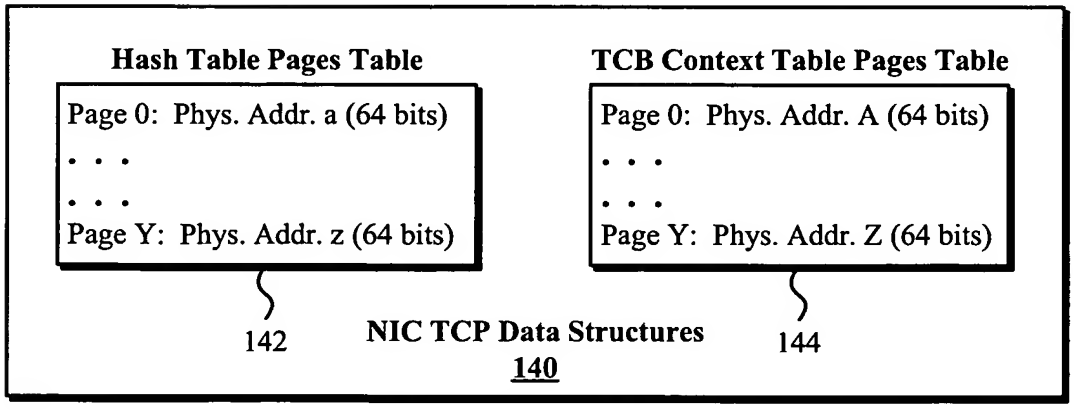
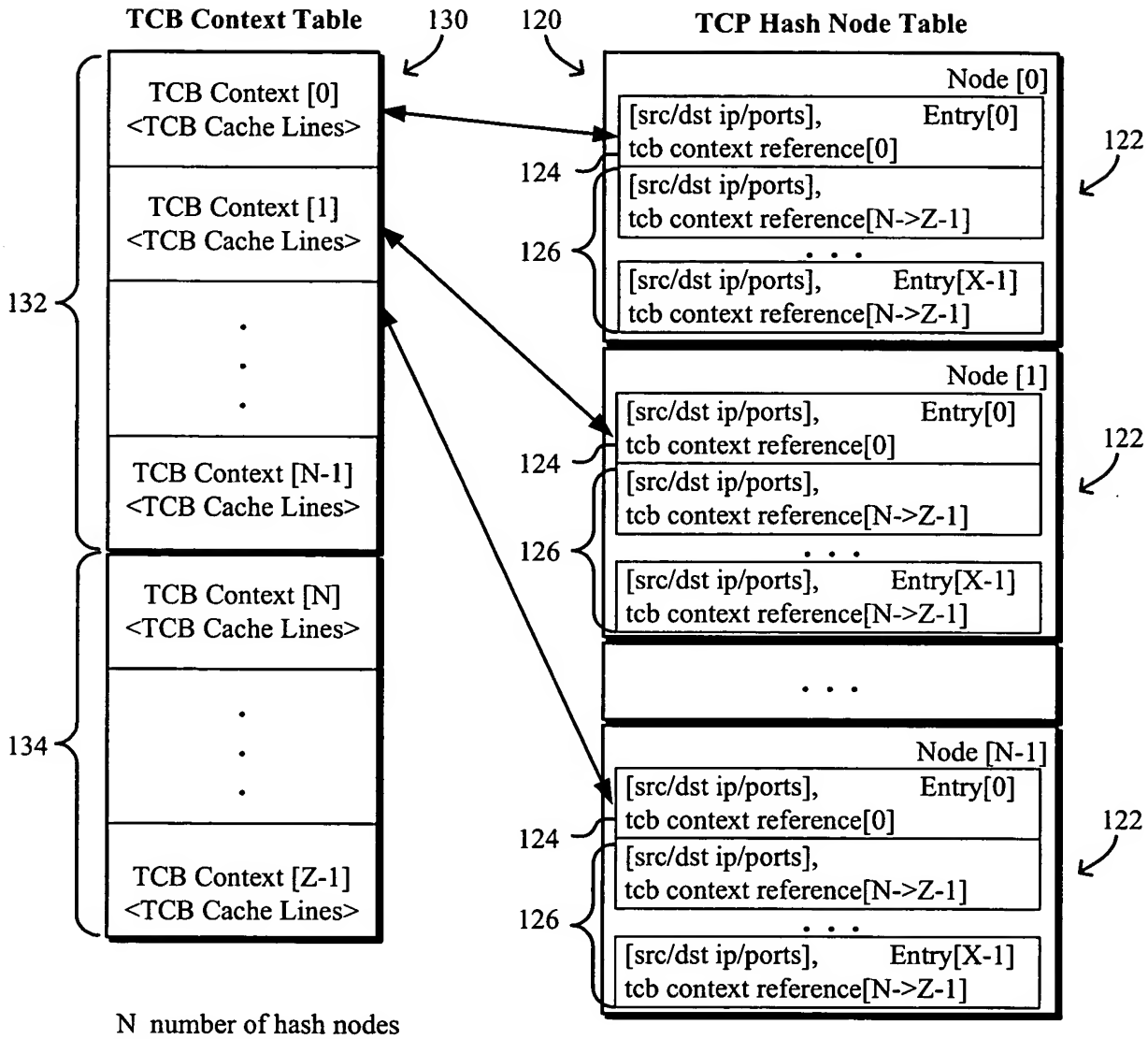

Hash Table Pages Table
Page 0: Phys. Addr. a (64 bits)
. . .
. . .
Page Y: Phys. Addr. z (64 bits)
TCB Context Table Pages Table
Page 0: Phys. Addr. A (64 bits)
. . .
. . .
Page Y: Phys. Addr. Z (64 bits)
142
NIC TCP Data Structures
140
144

FIG. 4



Host TCP Data Structures

FIG. 3

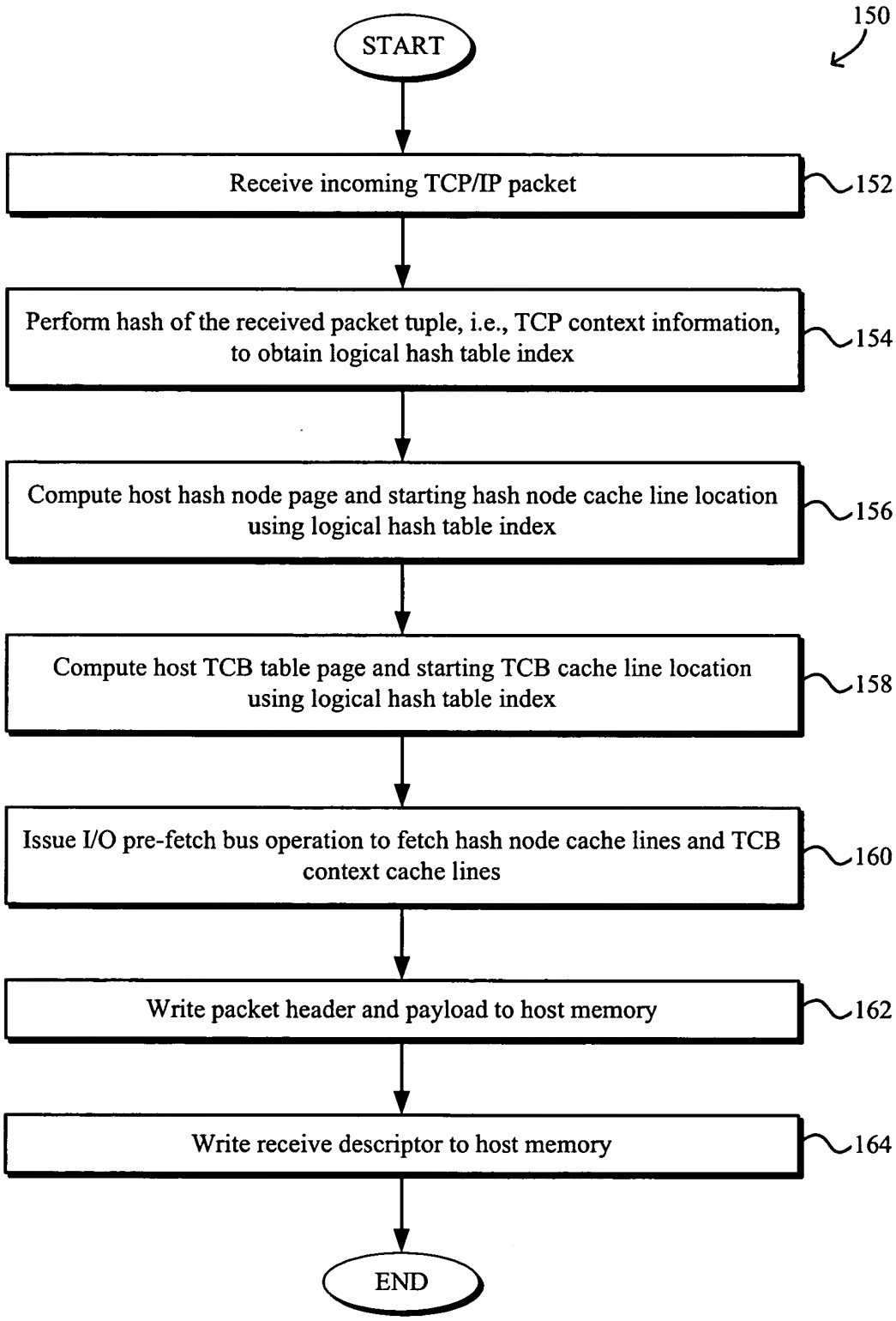

150
START
Receive incoming TCP/IP packet
152
Perform hash of the received packet tuple, i.e., TCP context information, to obtain logical hash table index
154
Compute host hash node page and starting hash node cache line location using logical hash table index
156
Compute host TCB table page and starting TCB cache line location using logical hash table index
158
Issue I/O pre-fetch bus operation to fetch hash node cache lines and TCB context cache lines
160
Write packet header and payload to host memory
162
Write receive descriptor to host memory
164
END

FIG. 5

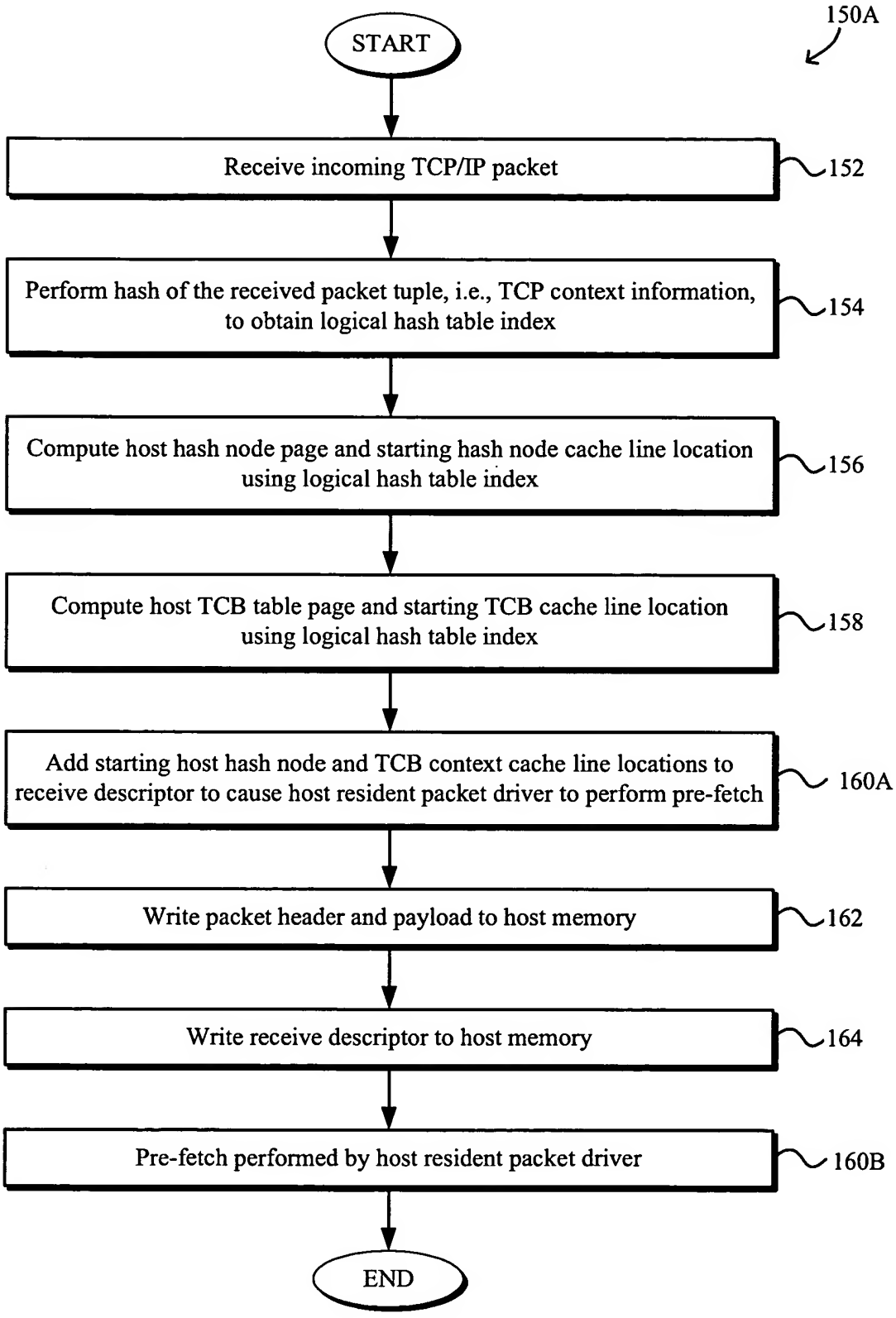

150A
START
Receive incoming TCP/IP packet
152
Perform hash of the received packet tuple, i.e., TCP context information, to obtain logical hash table index
154
Compute host hash node page and starting hash node cache line location using logical hash table index
156
Compute host TCB table page and starting TCB cache line location using logical hash table index
158
Add starting host hash node and TCB context cache line locations to receive descriptor to cause host resident packet driver to perform pre-fetch
160A
Write packet header and payload to host memory
162
Write receive descriptor to host memory
164
Pre-fetch performed by host resident packet driver
160B
END

FIG. 6